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ABSTRACT

Medical technologists are relative newcomers to academia since the development of 2+2 programs and some movement away from didactic teaching at hospital sites. Medical technology faculty are now just as much a part of the publish-or-perish syndrome as their basic science and liberal arts colleagues, although their research activity is not highly developed. A survey was undertaken of 109 academic institutions with medical technology programs having at least 20 students each. The response rate was 54 percent, of which a fifth were not usable. A total of 260 faculty medical technology members was reported; most were assistant professors or instructors. These faculty reported 437 published papers, most published by full professors. This groups also had the least ASCP certifications, and was mostly male. A significant difference was found in publishing activity between ASCP and non-ASCP faculty, and males and females differed on type of publication. Only 34 percent of the respondents reported research as a job requirement, and 45 percent reported it as a tenure requirement. Most program directors felt all their faculty had research skills, and ten percent thought none of their faculty had these skills. Only eight schools reported having programs specifically for faculty research development, although ten schools used various other methods to encourage it. It is concluded that as a female-dominated profession, medical technology has faculty development and career progress problems similar to those in nursing, and that the value of research must be increased and its pursuit encouraged. Data on faculty age, sex, certification, tenure status, educational level, and publications of faculty are appended. (MSE)

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PUBLISH OR PERISH: TECHNOLOGISTS IN ACADEMIA

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INTRODUCTION

Medical technologists are relative newcomers to academia since the development of 2+2 programs and some movement away from didactic teaching at hospital sites. Inherent in the college or university setting are the traditional academic responsibilities of teaching, service, and research. The research component of faculty responsibility has become increasingly important in recent years because of major financial problems at many colleges and universities. Funds garnered from outside research grants play an ever-larger role in the funding of universities, colleges, schools, departments, programs. Tenure and promotion are therefore becoming even more dependent on the scholarly activities of research, publishing, and funded grants at many institutions.

Medical technology faculty are now just as much a part of the "publish or perish" syndrome as their basic science and liberal arts colleagues. However, because our profession has been historically a technical-vocational type of training, the state-of-the-art in research activity of medical technology faculty is still in a developmental phase. With no Medical Technology terminal Ph.D. degree and the attendant research experience, it is possible that research done by medical technologists may be lesser in quantity and/or quality than that of other academic professionals. Indeed, the same could be said of many similar Allied Health professions with the possible exception of Nursing.

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It is helpful to review the development of research in the nursing profession to identify areas common to medical technology. One major nursing problem relates to the predominance of females in that profession. Investigators have found that, because nurses have not been trained in the research mode, research productivity has suffered. Scientific curiosity, educational levels, and experience do not match those of the traditional male scientist.[3]

Nurse researchers have also faced the lack of administrative resource and time commitments for faculty development. The proper environment in which to develop research skills, and a value system which motivates and commits faculty to participate in research are necessary.[2,11]

Research creativity has been raised as an issue for nurses. Large quantities of individual research investigations are not enough; the results obtained must be examined, combined, and evaluated to lead to a new conclusion which will help determine the direction of professional practice.[4] Bowie states that "the goal of nursing research is the improvement of nursing practice by providing a scientific basis for practice".[1] It is certainly the responsibility of the members of a profession to practice based on their own scientific investigations of the elements of that profession.[5]

Finally nursing literature traces the development of nursing research and finds it to be closely related to the allocation of federal funds at particular times. During the period marked by

federal funding for expansion of curriculums in allied health, much nursing research was educational in nature. Presently, since federal interest has shifted more to the relationship between human biology and human behavior, nursing research is moving toward investigation into more basic science areas as a basis for study of this relationship.[7]

Certainly all of these problems, definitions, and goals are applicable to the medical technology profession also. What, then, is the current state of medical technology research by members of the profession? What are the variables that may affect research productivity? What are the potential directions for the future of medical technology research by medical technologists? And how can we best achieve the goals that will benefit the practice of the profession and increase the academic prestige of our faculty and programs?

METHODS

A survey questionnaire was sent to 109 academic institutions with medical technology programs. Schools listed with a capacity of at least twenty students were chosen from the DHEW publication Allied Health Education Programs in Senior Colleges. Fifty-nine responses were received for a return rate of 54%. Of these, 47 were usable; the remaining twelve schools reported either that their MT programs were pre-professional programs within other departments and not taught by medical technologists, or that the MT instructors did not have academic appointments.

Demographic information was collected on academic rank, age, sex, education level, number of years on the faculty, and ASCP certification status. (Respondents were asked to identify certification as ASCP, other, or none. No MT certification other than ASCP was noted by any respondents.) In addition, information on research productivity for each academic level was sought. Finally faculty attitudes towards research and reasons for lack of productivity were identified.

RESULTS

A total of 260 faculty members was reported. The academic ranks are as follows: 11.5% full professors, 18.1% associate professors, 41.2% assistant professors, and 29.2% instructors.

Within each rank, the age range was generally as expected, with age obviously related to rank (Figure 1). Sex also appeared to be related to rank with the ratio of males to females increasing as rank increased (Figure 2). Numbers of faculty with ASCP certification decreased as rank rose, while tenured faculty increased with rank as expected (Figure 3). Educational level followed expected patterns with the majority of instructors having baccalaureate degrees, and the majority of full professors having Ph.D. degrees (Figure 4).

Four hundred thirty-seven (437) published papers were reported for the 260 faculty members. The smallest faculty group reported, full professors, published the most number of papers, had the

least number of ASCP certificants, and had a majority of males (Table I). Data from schools reporting that all faculty in a particular rank were either ASCP or non-ASCP, and from schools reporting all male or all female faculty in particular ranks were treated with the Chi-square test. A significant difference was found between ASCP and non-ASCP faculty, and also between males and females regarding the type of research publications. Proportionally, male and non-ASCP faculty published far more technical research than educational when compared to females and ASCP certificants (Table II).

Finally information regarding research requirements, skills, and attitudes toward research was collected. Only 34% of the schools reported that research was listed as a job requirement for medical technology faculty, while 45% reported research as a tenure requirement. Seventeen program directors felt that all of their faculty possessed research skills (ability to plan and implement a research design, analyze and interpret results, write a report) while 10 felt that few or none of their faculty possessed these skills. Only eight schools reported specific programs for faculty research development. However, to encourage research, 10 schools used various methods, such as offering release time and/or financial support, the activity of the program director as a role-model, personal and before-peer compliments, opportunities to work with graduate and honors students, assistance in proposal preparation, and the opportunity to be considered for promotion

and tenure. But 28 schools reported that no specific encouragement was offered to faculty to engage in research.

About half of the schools reported that faculty members are either moderately or slightly interested in research activity. But of the total faculty represented only 11% were reported as being very interested in research while 13% are either uninterested or unwilling to participate in research.

Reasons for the lack of research productivity were explored. Lack of time and lack of resources (financial and/or equipment) were the most common reasons given. Lack of skills and/or motivation were also mentioned by a large number of programs. In addition lack of space and distance from clinical facilities were noted by a few programs (Table III).

DISCUSSION

The results of the survey indicate that, as a female-dominated profession like nursing, medical technology has problems very similar to what the nursing profession has faced. Why are there still more male, non-MT faculty in higher academic ranks? Why is the technical research done mostly by these males? Why do MT faculty and programs appear to be uncommitted to research in so many instances? Are job descriptions faulty or are MT faculty not considered tenure-track material?

Clearly, the profession must devise methods to increase interest in research, skills in research, and time for research. The security of present academic positions and future positions,

where promotion for tenure will be increasingly required and more difficult to attain, depends on this. Certainly improvement in the practice of the profession also should take place regardless of promotion and tenure considerations.

Again we can look to the nursing profession for ways to achieve these goals. First, research activities should be planned for the undergraduate curriculum. In spite of already over-burdened curriculums, an effort should be made to engage undergraduates in some type of research activity during the clinical training period. Electives during rotation times can be used for individual research projects. Helping a clinical or research staff member or MT faculty member with data collection can introduce students to the research component of practice.[8] Short lecture series on beginning research skills and statistics can be planned.

Spector and Bleeks[10] propose a number of strategies to enhance research values in undergraduate nursing courses. These include:

1. the consistent use of cognitive and affective objectives pertaining to research in all courses. Example - research topics and questions are identified at every opportunity.
2. the role-modeling by instructors who consistently raise questions for students to consider regarding the practice of the profession.
3. the practical use of research results in both class and practice, making research seem worthwhile.
4. the application of research in practice and in writing assignments.

A difficulty for many beginning researchers is very elemental - where does the research topic idea come from? Strategies to solve this problem can be very simple. Clinical technologists can be asked to identify and propose daily laboratory problems for solution. Clinical studies may need replication. "Successive research", or building and expanding on previous work, may be undertaken.[9] Faculty or student skill development may also be advanced through workshops with consultants who are experts in choosing research topics and designs.[3] Pathologists and other clinical staff should be able to suggest many areas for investigation.

Although lack of skills has not been the largest problem noted by this survey, the level of MT expertise is perhaps a problem. In view of the present trend towards more basic science research, the profession needs to become involved in more scholarly technical research and creativity. As has been proposed for women entering the corporate business world, perhaps the answer is for female medical technologists to find mentors in the scientific world. These "teachers" would offer more than just the routine of doing the technical bench work to collect data; they would serve as guides to creativity and upgrade the scientific expertise of their medical technologist colleagues who could then be true co-investigators. Schools and programs must help to encourage this type of cooperation by making research an integral part of the faculty job description, leading to promotion and tenure.

Lack of equipment and/or resources has been cited as another reason for low research interest and productivity. Realistically,

since research grant money is less and less available for Allied Health projects, the idea to consider again is a merger with faculty colleagues in medicine or basic science departments as co-investigators.

The primary reason given for lack of research productivity, a lack of time, has already been argued by the nursing profession. Fawcett states that "lack of time" is simply not valid since it is only an effect of where research falls in the list of academic priorities of faculty. She proposes that research can be accomplished by all faculty with the proper planning. The major consideration in planning these research activities is the work setting, either clinical or academic.[6]

Although medical technology faculty are all aware that the teaching load is usually considerably heavier than that of most other faculty, that may not be readily accepted as an excuse for lack of research. Higher administration in schools with serious financial deficits are all too likely to consider program cuts in Allied Health areas with the view that these programs are more vocational than academic. It will be up to us to enhance the academic quality of our programs by proving the academic and scholarly quality of our faculty.

SUMMARY

Certainly research designed and implemented by medical technologists has come a long way, as evidenced by the many papers published in our professional journals. However, the

results of this survey identify problem areas. Proportionally, more technical research is being done by male non-ASCP medical technology faculty, and the excuses given for lack of research output are unlikely to be accepted by higher administration. Although this survey was not large and the data not treated in great depth, the results demonstrate that our professional image may be limited because of the level of our scholarly activity. The fiscal realities of higher education make it imperative that we find ways to upgrade the research potential of Medical Technologist faculty members and, even more important, the faculty of the future.

LEGEND SHEET

1. Figure 1 - Age of faculty
2. Figure 2 - Sex of faculty
3. Figure 3 - ASCP certification and tenure status of faculty
4. Figure 4 - Educational level of faculty

Fig 1

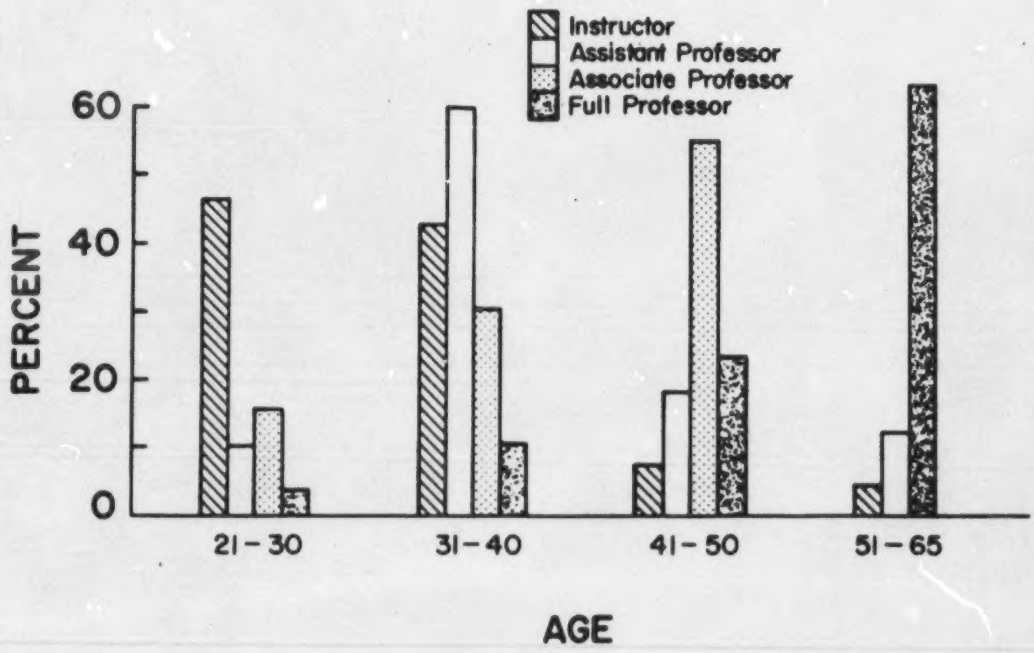

Instructor
Assistant Professor
Associate Professor
Full Professor
PERCENT
60
40
20
0
21 – 30
31 – 40
41 – 50
51 – 65
AGE

Fig 2

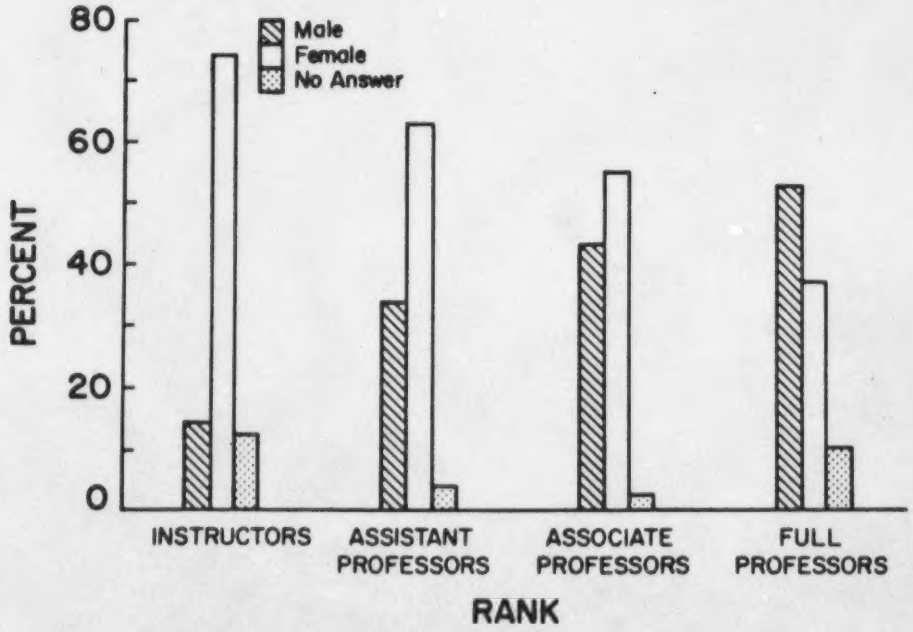

Male
Female
No Answer
PERCENT
80
60
40
20
0
INSTRUCTORS
ASSISTANT PROFESSORS
ASSOCIATE PROFESSORS
FULL PROFESSORS
RANK

Fig 3

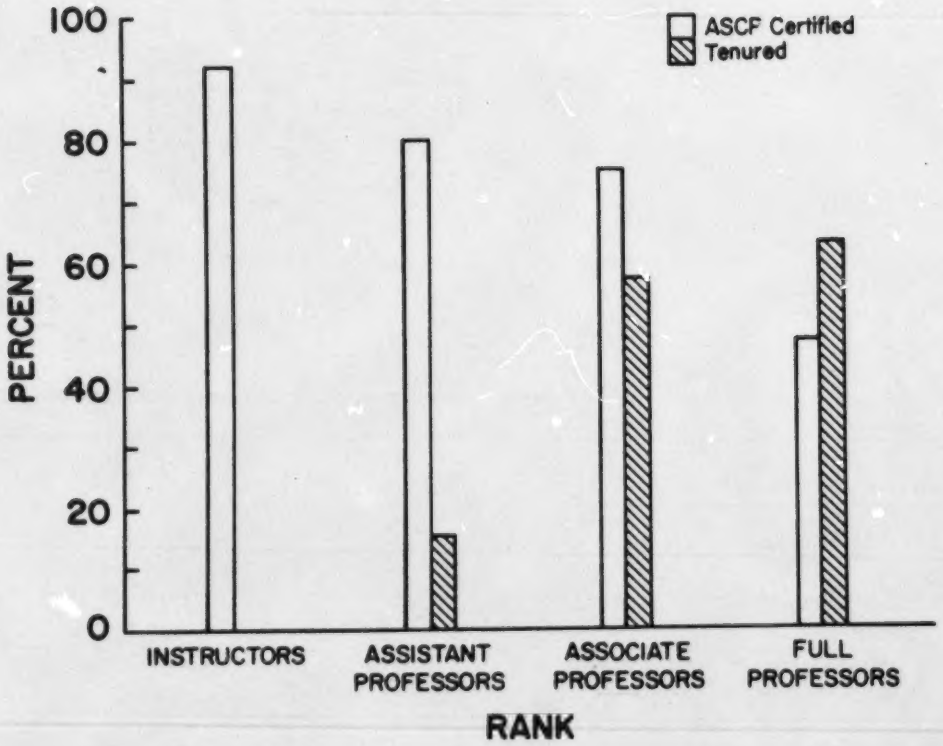
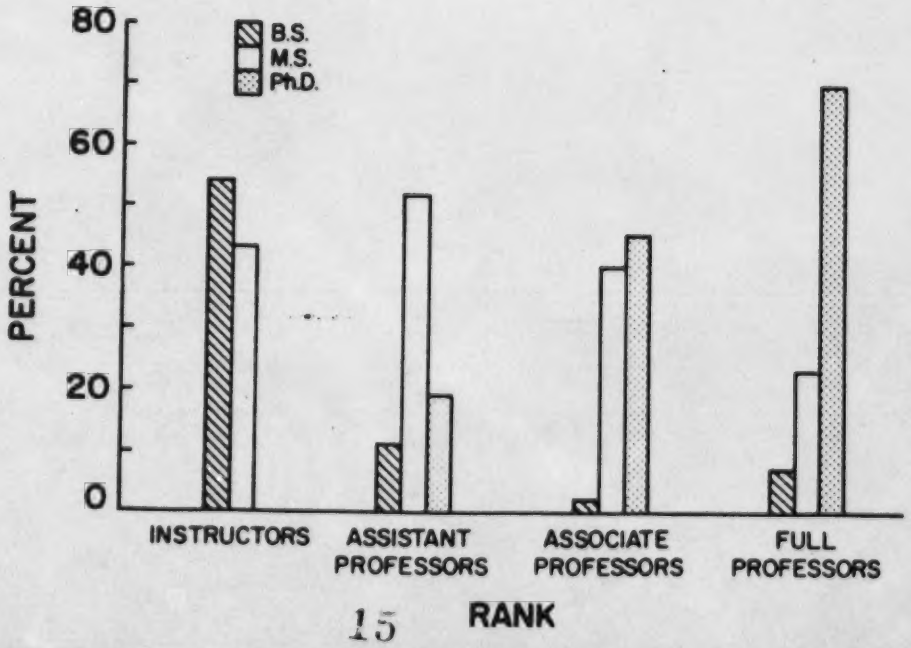

100
80
60
40
20
0
PERCENT
ASCF Certified
Tenured
INSTRUCTORS
ASSISTANT PROFESSORS
ASSOCIATE PROFESSORS
FULL PROFESSORS
RANK

Fig 4


80
60
40
20
0
PERCENT
B.S.
M.S.
Ph.D.
INSTRUCTORS
ASSISTANT PROFESSORS
ASSOCIATE PROFESSORS
FULL PROFESSORS
RANK

TABLES

1. Table I - Papers published by faculty
2. Table II - Papers published by sex and certification
3. Table III - Reasons for lack of research productivity

TABLE I

PAPERS PUBLISHED BY FACULTY

Rank	N	Breakdown of ranks by sex and certification		No. of papers published	Mean no. of papers/individual
		Males (%)	ASCP (%)		
Instructor	76 (29%)	14	92	18 (4%)	0.24
Assistant Professor	107 (41%)	34	80	109 (25%)	1.20
Associate Professor	47 (18%)	43	75	120 (27%)	3.0
Full Professor	30 (12%)	53	47	190 (44%)	9.5
Totals	260 (100%)			437 (100%)	

TABLE II

PAPERS PUBLISHED BY SEX AND CERTIFICATION**

Type of research	Male	Female	Chi-square	ASCP	non-ASCP	Chi-square
Technical	265	22	86.9 ***	65	258	57.7 *
Educational	5	17		25	5	

* p = 0.005

** Some schools could not be included in this analysis because provided data did not categorize published papers by sex and certification. Therefore publication totals do not correspond to totals reported in Table I.

*** Since the expected frequency for the female-educational cell is less than 5, Fisher's Exact Test was used to confirm the significance of the Chi-square value.

TABLE III

REASONS FOR LACK OF RESEARCH PRODUCTIVITY

Reasons	Schools Reporting (%)
Lack of time	74.5
Lack of resources	57
Lack of motivation	17
Lack of skills	10.6
Other	10.6

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